Forecast

FORests and ECological intensification of Agricultural ABSYSs

ABSTRACT

How can the footprint of agriculture on natural forests be reduced? Can agro-ecology be applied to forest-based agricultural production systems and improve their performance and sustainability? The Forecast project aims to produce analytical tools and educational resources for understanding, analysing and comparing forest-based agricultural systems.
A global comparative analysis of agricultural production systems practised in forest environments will make it possible to identify the most sustainable agricultural practices and to develop technical proposals that reduce the ecological impact of agriculture while improving its technical, economic and social performance. The objective of Forecast is to provide the tools and knowledge necessary to implement such a comparison.
The project will develop an online platform on agro-ecology in forests. Users will find pedagogical resources, analysis and modelling tools, and a database of case studies of forest ecological and social systems (ESS) allowing comparative analyses of the impact and performance of the agricultural practices implemented there.

Keywords : E-learning, Nicaragua, Madagascar, Cameroon, Database, Online, Agro-ecological intensification, Agroforestry, Forest, Tropical forests

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Flagship project : no

Project leader : Laurene Feintrenie Eric Penot
Project leader's institution : CIRAD
Project leader's RU : F&S INNOVATION

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Total budget allocated (including co-financing) : 170000 €
Funding : Labex

GOAL

Long term objective: Improve livelihoods of forest dwellers and limit deforestation and forest degradation through the development of sustainable family farming systems based on agro-ecological intensification principles.
Medium term objective: Foster innovative thinking and design of on farm research for sus-tainable and ecological intensification within government agencies and local NGOs of agricul-tural development.
Short term objective: Reinforce and develop knowledge on agro-ecological intensification principles and the specificities of forested landscapes. Strengthen capacities of analysis of agricultural practices through efficient tools. Share the information gathered.
This project also aims at building long-term international partnerships within the research consortium. Together we will prepare an answer to a broader call from H2020 in 2017. This second proposal will focus on implementation and use of the knowledge and tools produced in Forecast in a large set of sites, to reach our medium and long term objectives.

ACTION

The Forcast project consisted of three actions:

WP1: produce digital pedagogical resources to be freely available online, on ecological intensification of agricultural practices in forested landscapes. These resources include concepts from agriculture, agroforestry and forestry sciences, agrarian diagnosis approach, and methods of analysis of farmers' decision-making process.

WP2: produce tools to conduct spatialized technical, social and economic analyses of rural livelihoods at plot, household and landscape scales, based on digital devices used by the partners: Olympe, Map village. In an open science approach, develop a web platform (in three languages: French, English, Spanish) including these tools and an online database to be fed on a voluntary basis.

WP3: validate the tools produced by WP2 through participatory action research with students and local farmers trained by the high-education partners of the project in WP1.

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RESULTS

Madagascar :
The study sites are located on the east coast of Madagascar in the region of production of clove called Fénérive-Est. Two types of agroforestry systems (AFS) are present: cultivated and/or grazed parks, and complex AFS. The clove AFS contain other cash crops (coffee, vanilla, lychee and pepper), many fruit trees, trees for firewood and construction, medicinal plants and plants for various uses. The modeling of farms shows that AFS allows a significant saving for households thanks to the various self- consumed products. It shows a variable sensitivity to fluctuations in cash crop prices depending on the types of AFS and the structural characteristics of the farm, but the diversification of AFS is in favor of a better stability of income and the economic balance of the household.
Cameroon
In 2016 two contrasting sites of the Center of Cameroon were studied: Talba and Bokito. Bokito is a site where we find old cocoa plantations with complex multi-strata structure, and a species dominance of fruit trees. Originally installed in corridor forests, they extend to the neighboring savannah areas, nibbling the areas reserved for food crops. Talba, a pioneer forest front opened in the early 1980s, brings together very contrasting farm types, from local and migrant populations. The implanted cocoa agroforestry systems are of complex to simple structure, with a species dominance of forest trees. Food systems are diverse, and different from those of Bokito.
Nicaragua:
Trees on farms are fundamental resources for rural people. The motivations that drive farmers to grow trees on their farms are still poorly known. A first study, conducted in Waslala and La Dalia, identifies socio- economic factors that influence the presence of trees on farms. The results show a strong relationship between local livelihoods and trees, how peasant perceptions influence the cultivation of trees on farms, and the relationship between land tenure security and the presence of trees.

PERSPECTIVES

Future prospects:
The modelling tools and database developed in Forecast will be used in a second project to conduct a systematic meta-analysis of agriculture in forest landscapes in tropical, Mediterranean and European areas. Innovations will be co-constructed with stakeholders (farmers and others), involving national agencies and local organisations to ensure their promotion and implementation.